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MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No. 2637

Press
Mis.

62-69

Dated

4 11.

1862.

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
4th November 1862.*

No. 63. Read the following letter from Colonel W. I. BIRDWOOD, R. E., Chief Engineer, to the Secretary to Government, Public Works Department, dated Chepauk, 27th October 1862, No. 3,875 :—

SIR,

1 Letter from the Deputy Chief Engineer, Central Circle, No. 150, dated 18th October 1862.

1 Do. Captain Vertue, No. 1,431, dated 24th September 1862.

1 Estimate.

1 Plans.

1 Letter dated 24th December 1861, to His Excellency the Governor.

1. Agreeably to the orders contained in the Proceedings of Government No. 2,178, dated 12th September 1862, I have the honor to submit for approval an estimate of the probable cost of erecting a Wind Engine to work three pumps and to raise water to a height of forty feet, amounting in the aggregate to Rupees 4,000.

2. Captain Vertue, First Assistant District Engineer, Presidency, by whom the estimate has been prepared, considers a 2-horse power engine the best adapted for the purposes it is likely to be required in this country, and this view of the matter I also entertain inasmuch as by its surplussage of power it ensures the water being lifted to the assumed height and a constant delivery therefore certain when the engine is in motion. Moreover, as pointed out by the manufacturer in his letter of the 24th December 1861 to His Excellency the Governor on the subject, the difference in the cost of a 2-horse power engine and that of a $1\frac{1}{2}$ -horse power is but trifling compared with the advantages which the former in every respect possesses over the latter.

3. From the description given of these engines in the letter just mentioned, it appears to me that they will be very useful in the provinces, for the irrigation and drainage of land, as well as for keeping down the water during the construction of bridge foundations, and with the permission of Government I purpose circulating to District Engineers for information copies of the estimate herewith forwarded, and of the manufacturer's sketch to which it refers.

No. 64. ORDER THEREON, 4th November 1862, No. 2,637.

The Government defer passing orders on the subject of the foregoing letter until they are furnished with a report on the result of the experiment now being made by the Deputy Chief Engineer, Southern Circle, under G. O. dated 26th September 1862, No. 2,318.

(Signed) W. I. BIRDWOOD, Colonel, R. E.,
Secretary to Government.

17 New Park St. Southwark
London Dec 26th 1861.

Sir

I am favoured with your letter dated 2nd October and am happy to answer your enquiries respecting the Wind Engines and to give you every information in my power. The works you contemplate of draining the City of Madras by lifting the Sewage water to a height sufficient to give it a proper outlet to the sea is of such importance as to command my most careful attention and consideration. Although I do not know the various levels of the City or the relative levels with the sea, I am quite sure that you have proposed the best method possible by dividing the City into sections or blocks. It is partly on this plan our new and extensive system of drainage of the Metropolitan district is now being carried out. We have the low level, the middle level, and the high level drainage. It would doubtless be expensive and more easy at Madras to divide the City into more than three sections, the sewage water being collected in cisterns or reservoirs on each block and then pumped up to a larger cistern placed on such a level that when the tide is running out the sewage may be discharged into the sea and carried away. It would not be advisable to discharge the sewage at low water because the tide would wash it back again on the shore and it would become offensive. Provision should be made in the cistern that by means of a Sluice Gate or Valve near the top, the sea should enter it and fill it at high water, if not already filled by sewage water, so that when the tide has fairly ebb'd and the discharging Valve or Sluice at bottom of cistern is opened, there may be a sufficient volume of water to carry off all the solid matter away. This plan you will perceive would be infinitely preferable to that which is ordinarily pursued of

Yours truly
J. H. P.

letting the drains discharge themselves at low water.
There is one other point connected with the discharge of
the Sewage matter which is worth your consideration
viz. a sufficient water supply for flushing the Sewers.
Experience has proved that large sewers are by no means
as desirable as those which, while they have a sufficient
capacity to carry away the bulk of water or sewage they
are likely to be charged with, are no larger than is
necessary. Formerly it was the practice here to make
very large sewers, it was considered they ought to be
large enough to admit of any amount of deposit, and
still have a sufficient capacity to carry off all that was
required to pass through them. The result of this
system was, that the large drains became little more than
seepools, half full of the solid matter which accumulated,
the quantity of water passing through them never having
sufficient bulk to fill the sewers and by forced drive
this solid matter before it. The present system is to
have the drains only of the necessary size to carry off
the quantity they are likely to be charged with, no
accumulation whatever can arise, for at frequent
periods water from a high cistern is discharged into
these sewers which by its volume and force drives
every obstruction or accumulation before it. This is
called "flushing the sewers" it is a most effectual
and admirable plan. If the sewers were very large
the water would not have sufficient bulk or force
to so roughly cleanse them. I have no doubt that
after having rains in Madras the sewers are materially
relieved of accumulations, but that is an uncertain
and irregular remedy. Water should be pumped from
the river to a basin or reservoir, this could be used for
supplying the city (if of good quality) for drinking
purposes, but at the same time it could be made available
for fountains, for watering the roads, and for flushing
the sewers, as well as for extinguishing fires &c. &c.
I consider that Water supply and drainage of the
City of Madras are subjects intimately connected
and not easily separated.

The present Wind Engine of the Corporation of Madras is
not a very good one, it is a small affair, and is entirely a
question

question of quantity. They are simple and effective and
could be made to give any quantity of water as well as
to discharge any extent of sewage. They have the
advantage over steam that while they literally cost
nothing after first erection, they will work night
and day, and away can start or stop them in an
instant, at other than speed. They are so arranged by
that if left at work with their sails exposed to the
action of the wind, and the force of the latter becomes
more than they can easily resist they immediately
turn to give Wind and the Engine will either stop
or slacken speed. I find in some difficult cases
as much to you in respect of these Wind Engines as I
feel they deserve. I could send you extracts from a
great many letters written by Gentlemen of the
highest position, but I have a horror of voluminous
letters, however mention a few names of Gentlemen
who have these Wind Engines working on their estates
in the most satisfactory way. I should prefer you
writing to them yourself for asking some friend in
London to do so. I may mention to you that a few
days since Mr. Orr of your City came here under
the introduction of a Gentleman who has had one
of my Wind Engines. Mr. Orr saw the Engine in
different stages of progress and two that were finishing
and just being sent away to the Marquis of Salisbury
and one the for Sir Edmund Lacy Bart. of
Yarmouth. Mr. Orr took great interest in seeing
the Engine and also in making a letter I had long
received the day previously from a Gentleman in
Scotland here speaking in terms far beyond what
I ever do of the Wind Engine.
Mr. Orr saw my Wind Engine which is fixed here at
work. Pumping, turning out, and cutting off
with very little wind. After having seen all I had
to show him, I found he came from Madras and
I incidentally mentioned I was about to write to
you respecting the Wind Engine, he said he should
write

This is the way they usually are fixed. I have fixed one on the top of a building five stories high; it is for lifting sacks of corn for a large flour mill. It is 1 1/2 Horse & Nominal power. It lifts 70 sacks (containing 4 Bushels of Corn) a height of 49 feet per minute. It is immaterial how high as how near the ground the Engine is fixed provided the Wind can reach the sails. Instead of Wood for the iron ones can be substituted if preferred.

I have no particulars of the quantity of a cargo or the height it must be raised to, nor the place in which reference to the wind getting full either the size Engine or pump necessary. I should however recommend having full size Engine, to save the first outlay being the chief one, and the difference but little difference in the cost of a full size except the Wind Engine, it is desirable to have rather a surplusage of power than a deficiency.

I will give you a copy of the Service sent with the Horse Wind Engine & Pump before referred to. Several sets were made & the expense would be considerably reduced had it in common with the one and shipping charges as well as in freight.

1 Horse & Nominal power Wind Engine 110
 Vertical Shafting 17 1/2
 Horizontal Shafting 9 1/2
 3 Iron Cranks 8 1/2
 Iron Girders 15 1/2
 3 Sets Pump Rods 1 1/2
 A Set of 3-6 pump mounted on Cast iron foundation plate with trip & valve suction 34-10-10
 100 feet and suction pipe for a mill 25 ft deep 1 1/2
 Bolts and Nuts and India Rubber Washers 3-5-10
 for pumps and pipes
 Holding down Bolts and plates for Cranks &c 1 1/2
 5 Copper Oil Cups and Covers 12 6
 1 Spare Gun Metal Bearing 12 6
 2 St. Springs 14 -
 Wood & Zinc Covers for Turntable 15 -
 3 Spare Cup Leathers for pumps 15 -
 Packing Cases and Packing 9 10
 Dock and Shipping Charges 3 -
 £180-2-6

Brought forward 215-18-5

5 Copper Oil Cups and Covers	12 6
1 Spare Gun Metal Bearing	12 6
2 St. Springs	14 -
Wood & Zinc Covers for Turntable	15 -
3 Spare Cup Leathers for pumps	15 -
Packing Cases and Packing	10 5
Dock & Shipping Charges	3-9-6
£333-1-11	

The pumps above mentioned are lift pumps, the water being lifted 50 feet, these are more expensive than water suction pumps where the water is not required to be lifted more than 25 feet. It would be next to impossible to give you the price of pumps and all the appliances for different heights. I will however give you a preliminary Invoice showing what the difference would have been in the cost of the Engine & Pump if the water had been required to be lifted only 25 ft. The Engine in this case being of 1/2 Horse & Nominal power instead of 1 Horse.

1/2 Horse & Nominal Engine	75
Vertical Shafting	8 11
Horizontal Shafting	11-10-6
Cranks & Iron Cranks and Pump Rods	10-10-10
Iron Girders &c	1 15
3 Sets Pump Rods	4 10
A Set of 3-6 pump mounted on Cast iron foundation plate with trip & valve suction	34-10-10
100 feet and suction pipe for a mill 25 ft deep	1 1/2
Bolts and Nuts and India Rubber Washers	3-5-10
for pumps and pipes	
Holding down Bolts and plates for Cranks &c	1 1/2
5 Copper Oil Cups and Covers	12 6
1 Spare Gun Metal Bearing	12 6
2 St. Springs	14 -
Wood & Zinc Covers for Turntable	15 -
3 Spare Cup Leathers for pumps	15 -
Packing Cases and Packing	9 10
Dock and Shipping Charges	3 -
£180-2-6	

The

The cost of the small Pumping Engine, as per drawing sent would be as follows—

1 Horse Nominal Power Pumping Engine	35
Crank and Slings Joint	1 15
Strong Pump Rod with Small Joint, scotch	1 17 6
and Bearings 15 feet long	
6" Barrel Pump with Slings Pipe & heavy	
valves 50 feet with brog. elastic valves & valves	11-10
Box & foundation plate &c	
Bolt and Nut and India Rubber Washer	1 1 6
Holding Iron Bolt and plate for Slings	12 6
1 1/2" Spigot Iron Metal Bearing	6 6
1 1/2" Spigot	7 5
1 1/2" Cup Leather	5
Rolling Case and Bearings	4 10
Rolling Shipping Chaise	2 15

£ 60

As the above is to be added freight, and the cost of the pump for carrying the water any height required, but the Water Engine is an also applied with great success in and may for irrigating or draining land where there is not required to be more than about 6 feet. This is done by attaching the Engine to a Water Scoop wheel of my invention, which is found to be most effective. The wheel discharges the water through its center and consequently to some extent 6 feet by the wheel must be about 14 feet 6 inches. There has been many of these wheels working at Lord Stafford's power Engine. The wheel working only discharges a minute discharges 300 gallons of water for a minute another of same kind at R. D. Gifford Esq. Loughlin Hall Lancaster, with a 2 Horse Nominal Power Engine discharges 500 gallons of water for a minute. If after collecting the sewage water from the different Houses or Black into a large reservoir below the water must be near the sea, you should find it desirable to have one of these wheels and Engines you will find them very satisfactory. It would probably save the expense of having a well deep enough to allow of the water being off by gravitation.

I hope I have given you such information as will enable you to decide upon carrying out the work on an extensive scale at once. If you determine upon doing so and order several Water Engines, I would suggest whether it would not be desirable to have one of my men to superintend and assist to put them up. Most time would be saved in this respect, and as the result could not fail to be satisfactory I think the extra cost would be well repaid. I should be happy to arrange Freight Insurance for you and do all the needful without any charge or commission.

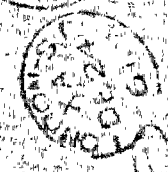
I have the honour to be Sir
Your most Obedt Servt

I refer you to either or all of the undermentioned Gentlemen.
John Yorke Esq. Banker Thrapston Northampton.
Hank & T. Villiers. Sully Hall Welford N. Rugby.
Edw. Morley Esq. W. Lister Esq. & W. G. Gifford Esq.
Wm. Smith Esq. Haughton Hall Lancaster.
and if you desire to ascertain my respectability, I refer you to my Bankers Messrs. Martinman Esq. of this City who have known me upwards of thirty years and I am quite sure will satisfy you on this point.

2

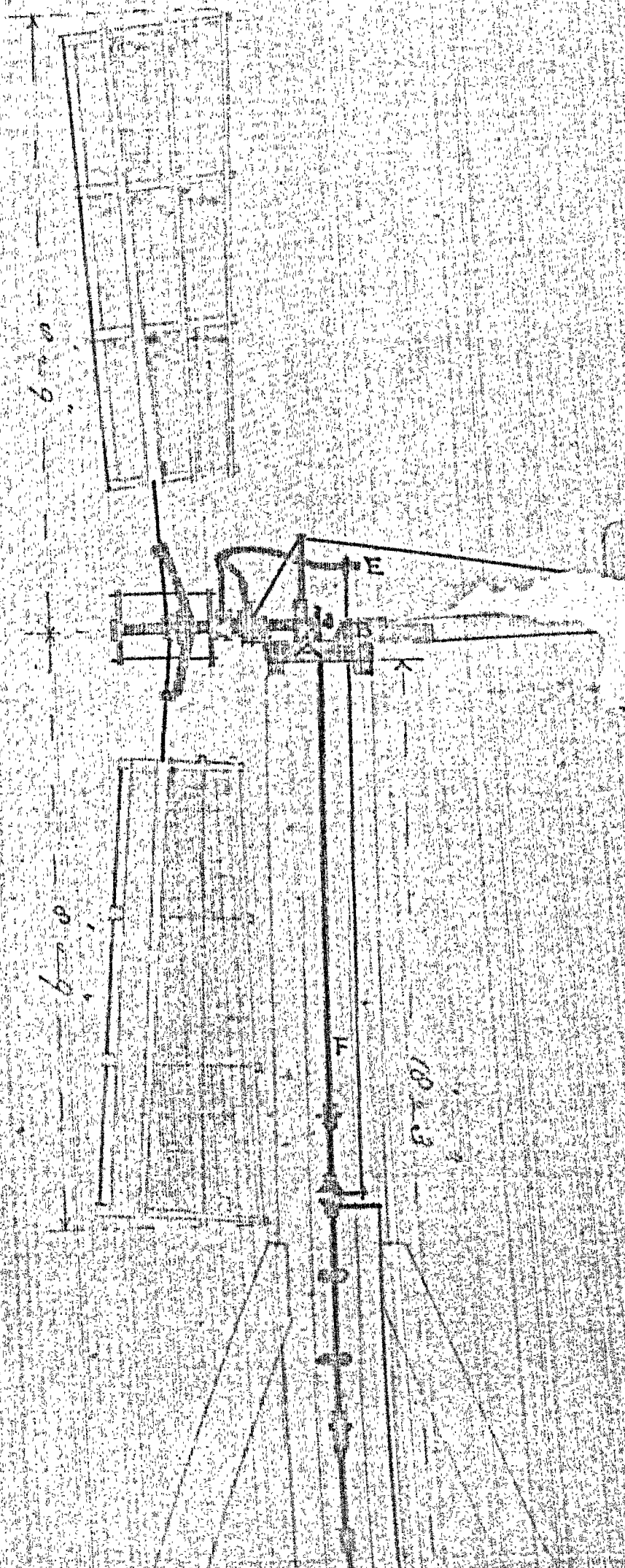
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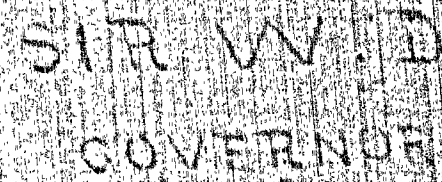
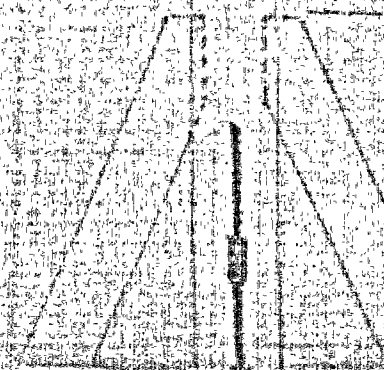
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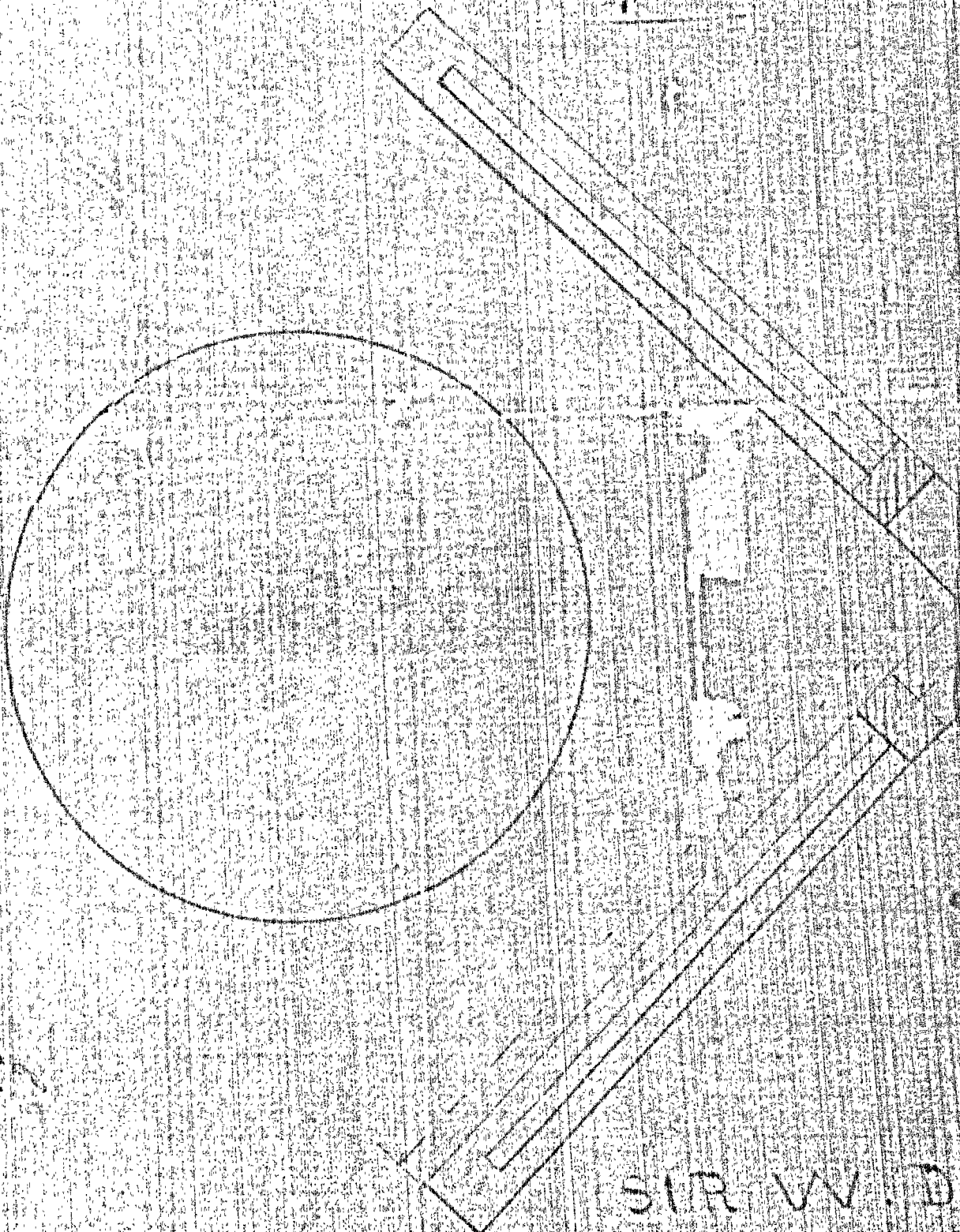
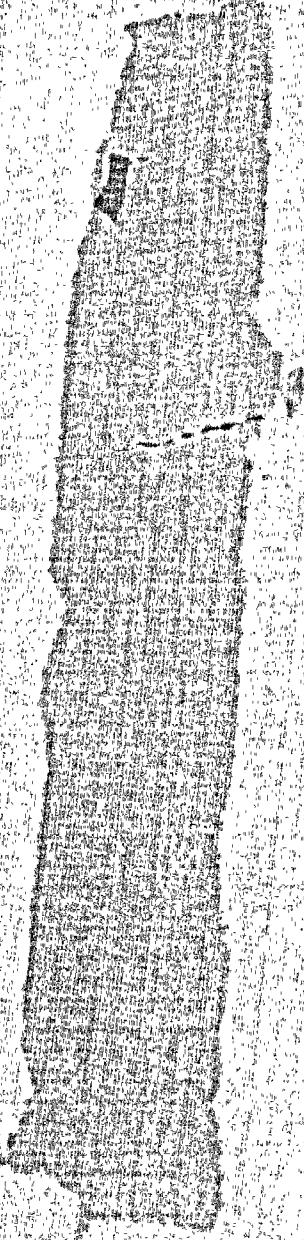
Mr William Davidson Esq

London



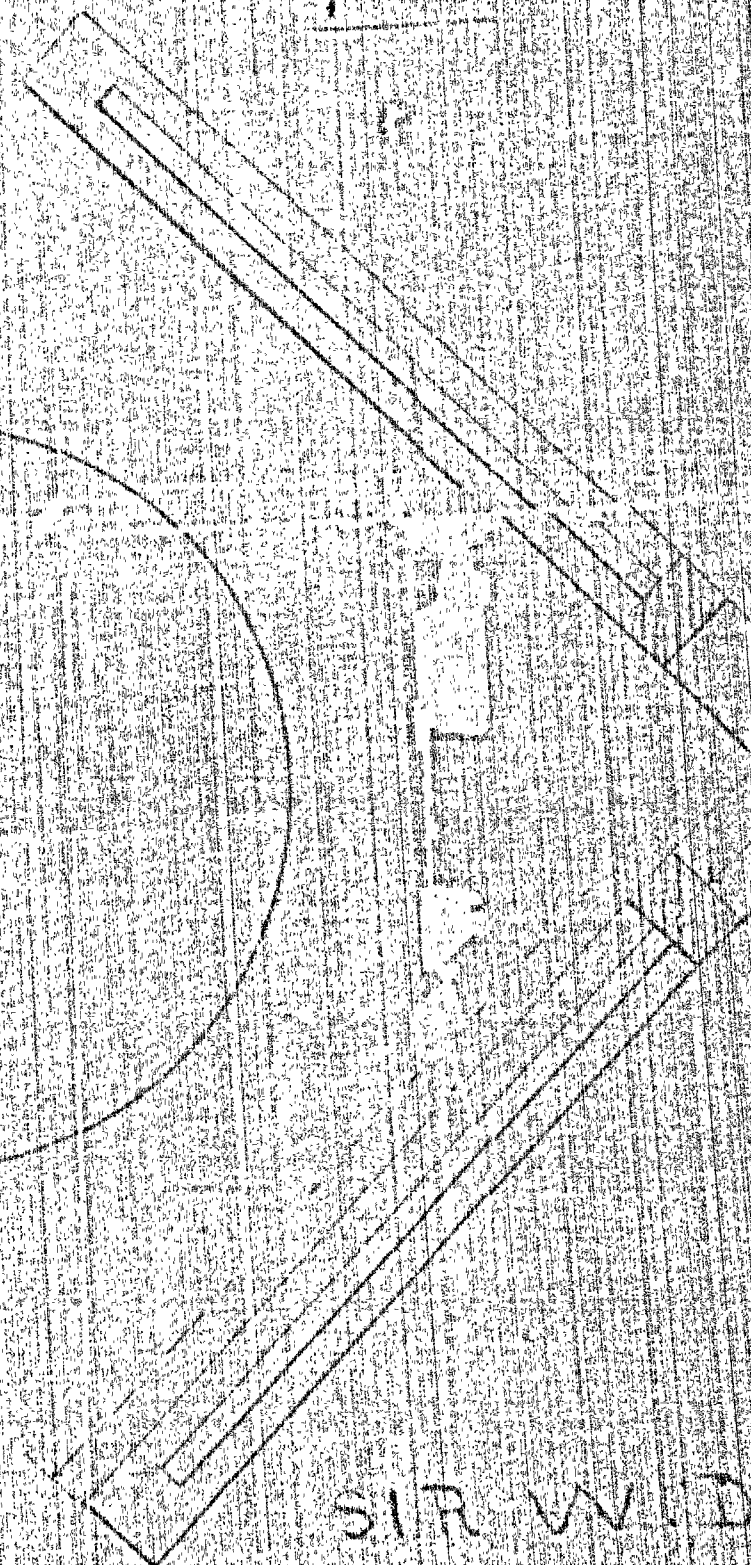
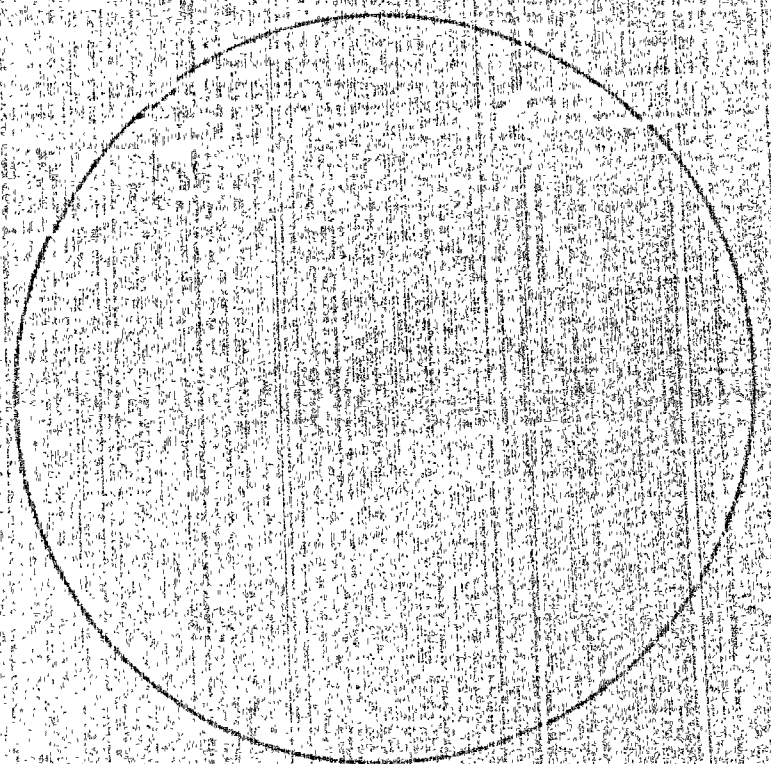
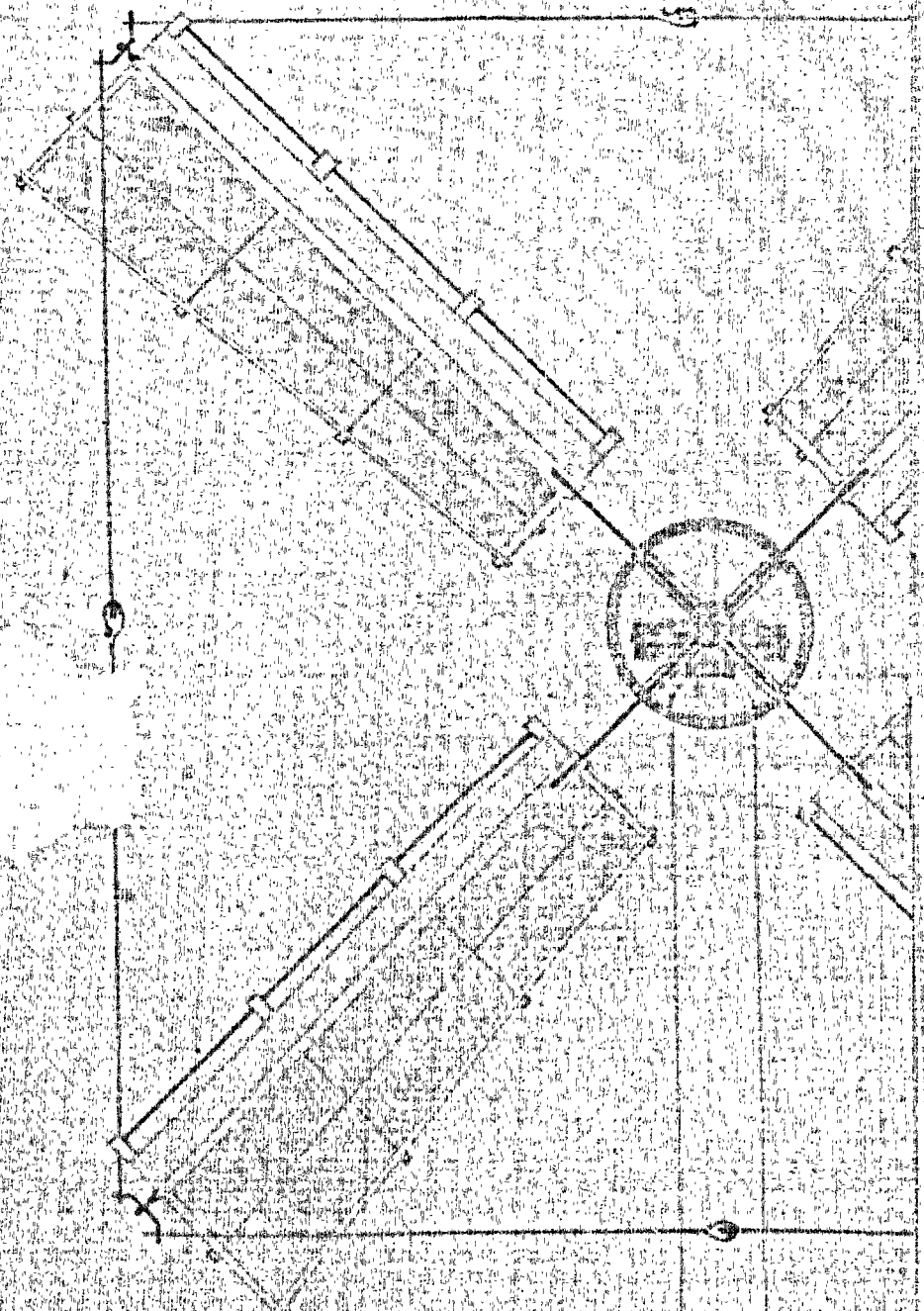


- A. Im. 3^d 2. Is the cast Iron Cap fixed on the post. B. Is
C. The Fan, which at all times, & in all changes
D. Wheel and Lion, by which in conjunction with
out of the wind at pleasure & in a moment, by
E. Vertical Shaft. F. Horizontal Shaft with
G. C. & Sling heads through which a roller pin goes, &
detatched, and is as readily replaced, so the
according to the strength of the wind.



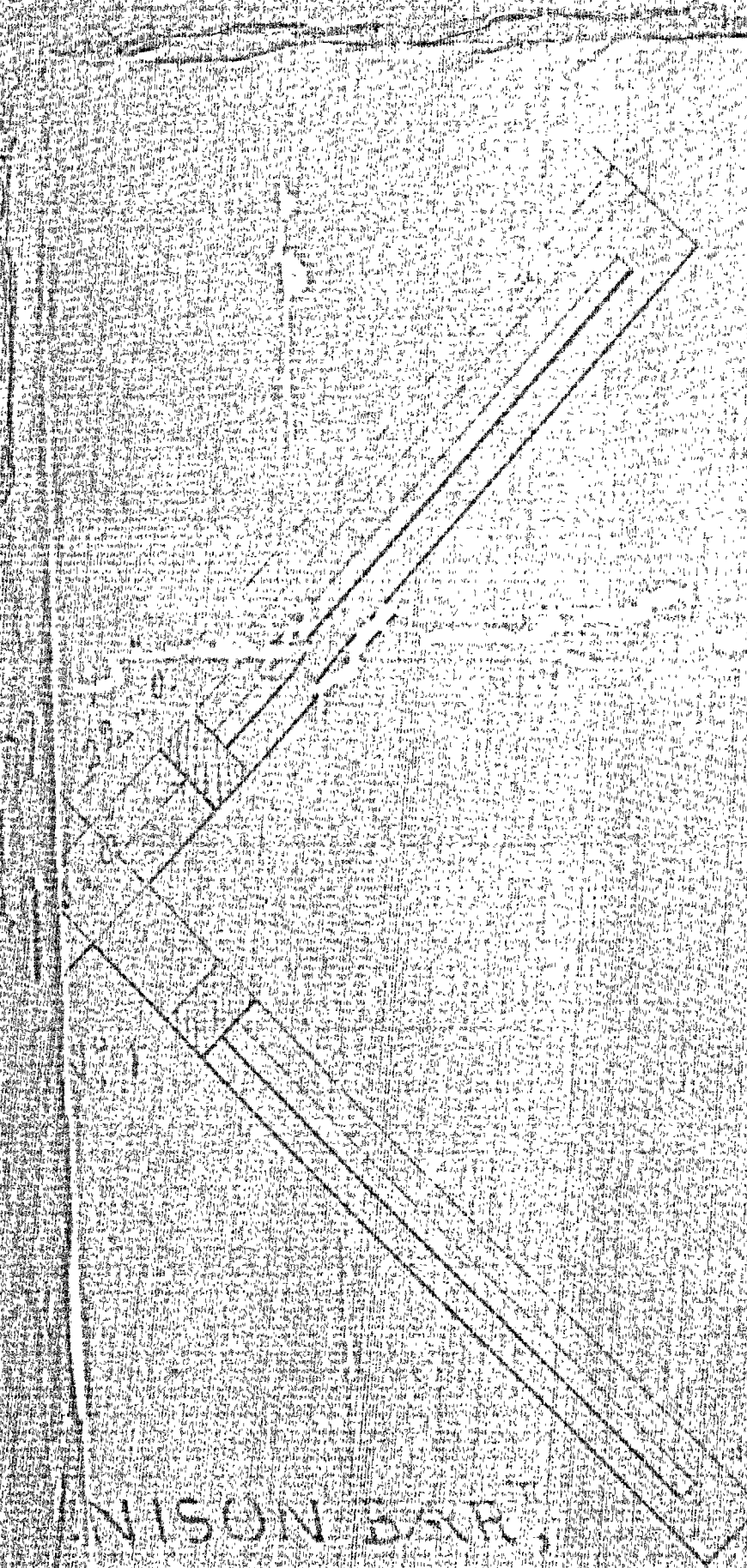
SIR W. D.
GOVERNOR

- A. Iron N° 2. Is the cast Iron Cap, fixed on the post. B. The Iron. which at all times, & in all changes, C. The Iron. which at all times, & in all changes, D. Wheel and Gear. by which, in conjunction with the rest of the wind at pleasure, & in a moment, E. Vertical Shaft. F. Horizontal Shaft. with G. & H. Sling heads, through which a wire pin, is detached, and is as readily inflated, & deflated, according to the strength of the Wind.



SIR WIND
GOVERNOR

- A - In N° 2 Is the cast Iron Cog fixed on the post. B - The Cog which at all times, & in all changes, C - The Cog which at all times, & in all changes, D - What used to be, by which, in conjunction with, E - Vertical Shaft - F - Horizontal Shaft, with G. & H. Slings heads, through which a little per piece, detached, and is as readily replaced, so that, according to the strength of the Mill.



PATENT SELF-REGULATING WIND ENGINE
OF TWO HORSE NOMINAL POWER. --

[illegible]

- PATENT SELF-REGULATING WIND ENGINE
OF TWO HORSE-NOMINAL POWER --
- N. 1. Plan of Stepped Pile and wind wheel, showing the position and distance of the Pile at bottom --
2. Elevation of the Pile, showing the position of the wind wheel, and the height of the Pile -- and two Sails
standing vertically, and the angle of the Pile, and the distance of the Pile from the wind wheel --
3. A plan of the 8 Sails of the wind wheel, showing the position of the Pile, and the distance of the Pile from the wind wheel --
4. A plan of the 8 Sails of the wind wheel, showing the position of the Pile, and the distance of the Pile from the wind wheel --
5. A plan of the 8 Sails of the wind wheel, showing the position of the Pile, and the distance of the Pile from the wind wheel --

From the reading on the Sails,
by the Sails to the Wind.
and above the Sails are turned into
a by turning the Sails from a. to b.
Two Power working in One jump.
By moving which, the pump is instantly
e. less on three jumps can be worked

JOHN R. PEILL
17 New Park Street
SOUTHWARK
LONDON.

JOHN R. PEILL
17 New Park Street
SOUTHWARK
LONDON. —

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17 New Park Street
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LONDON.

Central Office of P.W.
C. Chepauk R.
27 October, 1862.

N^o 3875

Thos. G. J. Birdwood M.E.
Colonel G. J. Birdwood M.E.
Chief Engineer D.P.W.
To, The Secretary to Government.
P.W.D.

Public. Sir, Agreeably to the orders
contained in the Proceedings of
the Government of 21st 21st 1862, I have the
honor to submit for a perusal
an Estimate of the probable
cost of erecting a Wind Engine
to work three Pumps and
to raise water to a height of
40 feet, amounting in the
aggregate to Rupees 4000-
2.
Captain Vertue
Assistant District Engineer
Presidency

Central Office of P.W.
Chennai.
27 October, 1862.

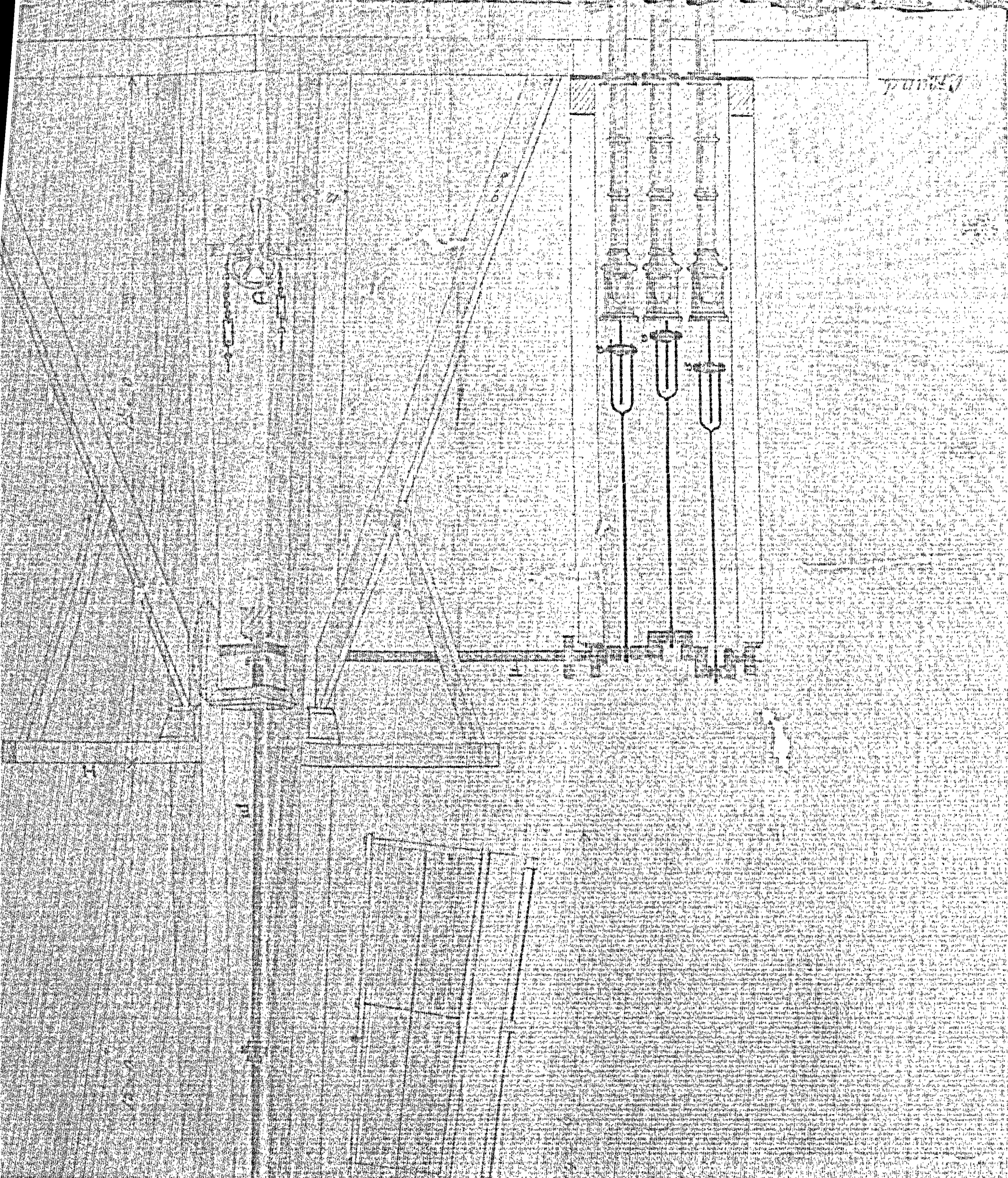
N^o 3875

To,
Colonel W. J. Birdwood M.B.,
Chief Engineer S.P.W.
To, of
The Secretary to Government
P.W.D.

Public - Sir,

Agreeably to the orders
contained in the Proceedings of
the Government of P.W.D. dated 12th
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to work three Pumps and
to raise water to a height of
40 feet, amounting in the
aggregate to Rupees 4000-
00-00.

Captain Vertue 1st
Assistant District Engineer
Presidency



Central Office of P.W.
Chepauk R.
27 October, 1862.

N^o 3875

From,
Colonel W. J. Birdwood M.B.
Chief Engineer S.P.W.
To,
The Secretary to Government
P.W.D.

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40 feet, amounting in the
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2.

Captain Vestue 1st
Assistant District Engineer
Presidency

Presidency by whom the
Estimate has been prepared,
consider a two Horse Power
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the purposes it is likely to
be required in this country, and
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its surplusage of power it
ensures the water being lifted
to the assumed height and a con-
-stant delivery therefore certain
when the Engine is in motion.
Moreover as pointed out by the
Manufacturer in his letter
of the 24th December 1861 to
His Excellency the Governor
on the subject, the difference
in the cost of a two Horse
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respect proposes over the latter.
3. From the description
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to me that they will be very
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the irrigation and drainage of
land, as well as for keeping
down the water during the
construction of Bridges &
Junctions, and with the
permission of Government
I purpose circulating to our
District Engineers for infor-
-mation copies of the Estimate
herewith forwarded, and of the
Manufacturer's Sketch to which
it refers.

Central Office, P.W.
Chequers
27 Oct. 1862.

The Secy. to Govt.
P.W.
Conf. R. R. R.

I have the honor to be,
Sir,
Your most Obedt. Servt.
Wm. R. Colvill M.A.
Chief Engineer P.W.

